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Chapter XIII

Helicopter Evacuation At Sea *

A GUIDE FOR MERCHANT VESSELS

WHEN A MERCHANT VESSEL is faced with a medical evacuation at sea, lives depend on knowing the right procedures and on planning well in advance. Obviously, getting a patient to a doctor is foremost in everyone's mind. However, the patient is not the only one in danger. An oversight or poor planning on the ship can imperil the helicopter, its crew, and even the patient's shipmates helping on deck. Knowing the correct evacuation procedure makes it safer for everyone. Most procedures used by U. S. Coast Guard helicopters are identical to those practiced throughout the world.

First, distance will determine whether an evacuation is even possible. The maximum range of the types of helicopters now used by the U. S. Coast Guard, the HH-52A amphibious single-turbine powered and the HH-3F amphibious twin-turbine-powered, is 150 and 300 nautical miles respectively. This is in *ideal* weather with *ideal* weight aboard, and includes going out, hovering for 10 minutes, and returning. Bad weather or extra weight shorten these distances.

Obviously, if a merchant vessel is 500 miles at sea and needs a helicopter evacuation, she will have to divert and head for a point where

a helicopter can reach her. Normally, the *Rescue Coordination Center* working on the case will tell the ship if a diversion is necessary, and a rendezvous point will be established.

The sooner the Captain acknowledges by message that the ship will be diverted to the designated rendezvous point and gives its estimated time of arrival, the sooner the helicopter can be launched. If the vessel already is within helicopter range, a diversion in the direction of the helicopter's base may be beneficial to speed the removal of the patient.

For planning the evacuation and discussing the patient's condition, good ship-helicopter communication is crucial. A fixed-wing aircraft often escorts a helicopter during an offshore evacuation, both to locate the ship in order to guide the helicopter to the scene, and to help with communications. Therefore, it is not unusual for a fixed-wing aircraft to circle the vessel and communicate with it before the helicopter arrives, relaying information until the helicopter is within communication range.

Voice communications between ship and aircraft normally are conducted on international distress and/or calling frequencies such as 2182 kHz and 156.8 MHz. Other frequencies common to both helicopter and vessel may be used, but once good communications have been established, frequency changes should be avoided. If necessary, helicopters can transmit and receive voice—Double Side Band or Single Side Band—on high frequencies between 2,000 kHz and 30,000 kHz. Homing capabilities for the

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helicopter often are available on many frequencies.

If voice communications cannot be established when it arrives on the scene, the helicopter will attempt to set up communications through other means. These consist of: lowering a portable radio, using a portable loud hailer, dropping message blocks, lowering a handset connected to the helicopter's intercommunications equipment, using a chalk board, or using hand signals. If there is no practical way of communicating, the helicopter may move right into position and begin the hoist.

Whatever the communication method on scene, the vessel earlier should have provided the *Rescue Coordination Center* with as accurate a position as possible, including course, speed, weather and sea conditions, and wind direction and velocity. *Medical information on the patient should include whether or not he is ambulatory. Coast Guard helicopters normally do not carry a stretcher, so if one is needed, the crew must know before takeoff so it can be put aboard.*

After the helicopter has taken off, the vessel will be told its estimated time of arrival (ETA). Most probably, communications will be established first with the fixed-wing aircraft, and later with the helicopter as it gets closer. Frequent transmissions may be requested from the ship for homing purposes, so she should stand a continuous watch on the assigned frequency.

With or without ship-to-aircraft communication, the Captain can prepare for the hoist prior to the helicopter's arrival. Most merchant vessels have a clear area from which the hoist can be made safely, usually on the fantail. The more space made available, the easier and less hazardous is the hoist. A horizontal distance of 50 feet in all directions from the helicopter body is a minimum safe clearance. Although Coast Guard helicopters can hoist from substantial heights, the higher the hoist, the more difficult and dangerous it is.

If the hoist is to be from the fantail and an awning covers it, this should be removed and tied up securely, along with any other items that may be blown about by the rotor downwash of the helicopter. Booms extending aft near the fantail should be raised as vertically

as possible alongside the king posts. Aft flag-staffs should be taken down and antenna wires or cables extending to the stern removed, if possible. Any reduction of obstruction on the stern, or wherever the hoist is made, will mean a lower and easier hoist.

Shortly before the helicopter arrives, and if the weather and the patient's condition permit, the patient should be brought up from below and placed under cover near, but not in, the hoist area. Blankets should be wrapped securely around the patient so the rotor downwash does not blow them away.

As the helicopter arrives, change the vessel's course into the wind, ideally with it about 20 degrees on the port bow. It is not only unnecessary for the vessel to slow or stop, but actually preferable to maintain normal speed because the helicopter can make the hoist with better control at a forward speed of 10 to 15 knots.

Final instructions for the hoist will be given by the pilot after seeing the ship and its obstructions. The pilot may not want to use the planned position, but will lower the basket or stretcher to another section of the vessel, if that appears safer. *The helicopter is equipped with a rescue basket for patients able to sit in it. However, if a stretcher is needed, it should have been requested so that a specially-equipped one with a hoisting bridle can be used. It is difficult to adapt quickly a ship's stretcher to this type of suspension.*

During its flight, the aircraft builds up a static electricity charge. Anyone who reaches up to take hold of the basket or stretcher will most certainly get a shock. *Therefore, always let the basket or stretcher touch the deck before handling it.* If a high hoist is involved, or if the hoist is from a confined space, the helicopter may lower a trail line. Deck personnel can guide the basket to the deck with this line, as long as they do not touch the basket itself.

Instinctively, the patient will grasp the side of the basket. The patient should be warned of the possibility of injuring his fingers if the basket hits the side of the helicopter as it is being brought aboard. When the patient is ready for the hoist he should nod his head. Then deck personnel will signal the hoist operator in the helicopter by indicating thumbs up,

and the hoist begins. The basket or stretcher should be steadied to minimize swinging, and steadying lines used if the hoist is so equipped. For safety, nobody should stand under the basket.

If the patient is so ill that the stretcher must be brought to him, it will have to be unhooked from the hoist cable. *Don't try to take the stretcher away from the hoist point without unhooking and letting it go free.* Normally, the pilot will retrieve the cable, then pull away from the ship until he sees the patient aboard the stretcher and ready to be hoisted. *Never hook the cable to any part of the ship! Never secure the litter or the rescue basket to the vessel, while the hoist cable still is attached to the litter or basket!*

Special lighting precautions will be necessary if the hoist takes place at night. Because of visibility and depth perception problems and the pilot's inability to judge his height above the water, he probably will have to make an instrument approach to the vessel. Lighting of the ship and the hoist area is necessary, but it is important not to shine any lights into the cockpit of the aircraft, nor to have any deck lights pointing up toward the helicopter. Such

lights can disorient or blind the pilot. If a searchlight is used to help the aircraft locate the ship, it should point vertically and be secured, once the helicopter has reached the area. Any boom lights used to light the deck should be directed downward.

Hoists can be made from the deck of ocean-going vessels 99 percent of the time. Although using a small boat from which to hoist the patient has been done successfully, it is the exception rather than the rule. If a small boat must be used, the sea should be relatively calm, with the boat underway during the hoist to maintain steerageway and to keep from foundering in the rotor wash of the helicopter. Again, the wind should be dead ahead or on the port bow.

Every helicopter medical evacuation at sea is different, and each presents its own problems. Communications between pilot and ship may be impossible. Operations at night, or under poor weather conditions, require the utmost caution and capability of the pilot. But in each case, knowing what to expect and how to prepare, and what the accepted procedure is, can save time, effort—and a life.

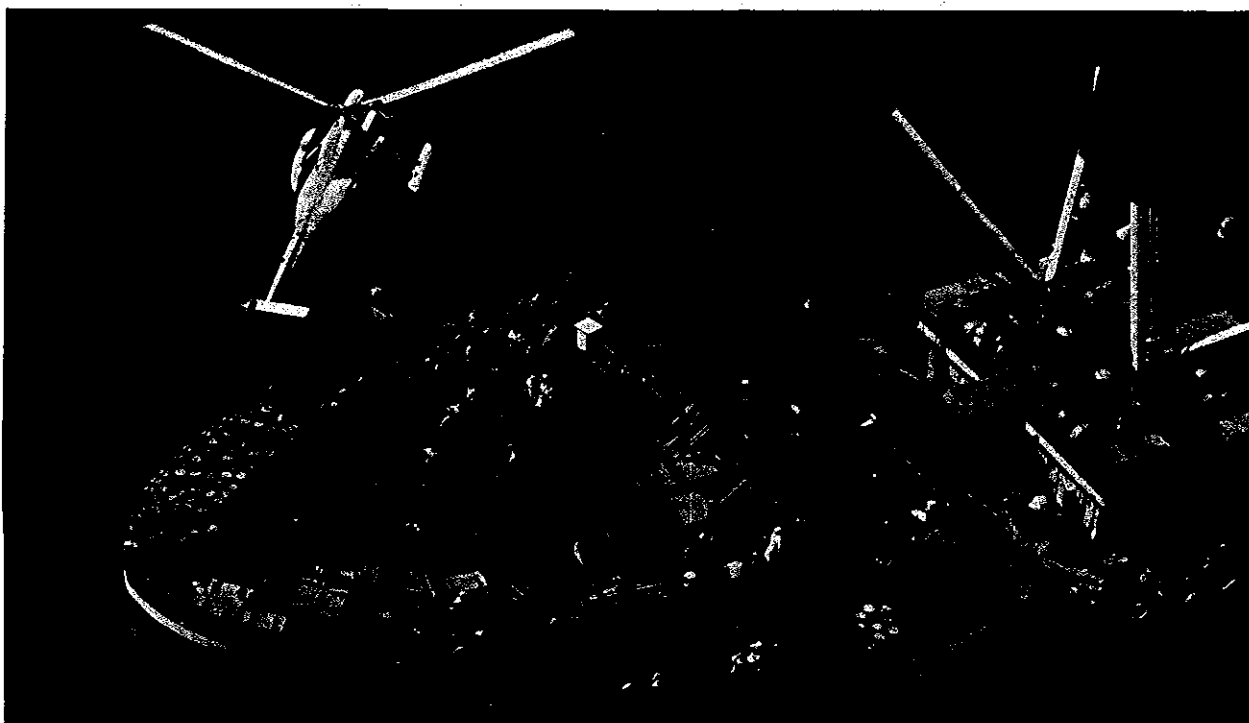


Fig. 13-1. During a medical evacuation at sea, a basket is lowered from helicopter to vessel to pick up the patient.

HELICOPTER EVACUATION CHECKOFF LIST

This checkoff list was prepared for use in evacuations carried out by U.S. Coast Guard helicopters. In general, these procedures are applicable to helicopter operations conducted by other rescue agencies.

Remember:

Helicopter evacuation is a hazardous operation to the patient *and* the plane crew, and it should be attempted only when the life of the patient is gravely threatened. Provide the doctor with all the information you can about the patient so that an intelligent evaluation can be made on the need for evacuation.

When requesting helicopter assistance:

1. Give an accurate position, speed and course of the vessel; time; weather conditions; wind direction and velocity; voice and CW frequencies.
2. If not already provided, give *complete* medical information including whether or not the patient is ambulatory.
3. If your vessel is beyond helicopter range, advise on your diversion intentions so that a rendezvous point may be selected.
4. If there are any changes, advise immediately. Should the patient expire prior to arrival of the helicopter, be sure to advise. Remember, the flight crew are risking their lives attempting to help you.

Preparations prior to arrival of the helicopter:

1. Provide continuous radio guard on 2182 kHz, or specified *voice* frequency if possible. The helicopter cannot operate CW.
2. Select and clear the most suitable hoist area, preferably aft, with a minimum 50-foot radius. This must include the securing of loose gear, awnings, and antenna wires. Trice up running rigging and booms. If the hoist is aft, lower the flagstaff.
3. If the hoist is at night, light the pickup area as well as possible. *Be sure you do not shine any lights on the helicopter*, so the pilot is not blinded. If there are obstructions in the vicinity, put a light on them so the pilot will be aware of their positions.
4. Point searchlights vertically to aid in locating the ship, and secure them when the helicopter is on scene.
5. Advise on the location of the pickup area *before* the helicopter arrives, so that an approach may be made aft, amidships, or forward, as required.
6. There will be a high noise level under the helicopter, making voice communication almost impossible. Arrange a set of hand signals among the crew who will assist.

HELICOPTER EVACUATION CHECKOFF LIST (Continued)**Hoist operations:**

1. If possible, move the patient to a position as close to the hoist area as his condition permits—*time is important*.
2. Normally, if a litter is required, it will be necessary to move the patient to the special litter which will be lowered by the helicopter. Be prepared to do this as quickly as possible. Be sure the patient is strapped in, face up, *with a life jacket, if his condition permits*.
3. Be sure the patient is tagged to indicate what medication, if any, was administered, and when.
4. Have the patient's medical record and necessary papers in an envelope or package ready for transfer *with him*.
5. Change course so the ship rides as easily as possible with the wind on the bow, preferably on the port bow. Try to choose a course to keep stack gases clear of the hoist area.
6. Reduce speed if necessary to ease the ship's motion, but maintain steerageway.
7. If you do not have radio contact with the helicopter, when you are in all respects ready for the hoist, signal the helicopter to come in with a "come-on" by hand, or at night by flashlight.
8. To avoid static shock, allow the basket or stretcher to touch the deck prior to handling.
9. If a trail line is dropped by the helicopter, guide the basket or stretcher to the deck with the line. Keep the line clear at all times.
10. Place the patient in the basket, sitting with both hands clear of the sides, or in the litter as described above. Signal the helicopter hoist operator when ready for the hoist. The patient should signal by nodding his head, if he is able. Deck personnel should give thumbs up.
11. If it is necessary to take the litter away from the hoist point, unhook the hoist cable and keep it free for the helicopter to haul in. *Do not secure the cable to the vessel or attempt to move the stretcher without unhooking.*
12. When the patient is strapped in the stretcher, signal the helicopter to lower the cable, hook up, and signal the hoist operator when ready to hoist. Steady the stretcher from swinging or turning.
13. If the trail line is attached to the basket or stretcher, use to steady. Keep feet clear of the line.